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# SOME IMPORTANT GRASSES AND FORAGE PLANTS FOR THE GULF COAST REGION.

BY

S. M. TRACY,

*Special Agent, Farm Management Investigations,*
*Bureau of Plant Industry.*


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# LETTER OF TRANSMITTAL.

U. S. Department of Agriculture,
Bureau of Plant Industry,
Office of the Chief,
*Washington, D. C., May 18, 1907.*

Sir: I have the honor to transmit herewith a paper entitled "Some Important Grasses and Forage Plants for the Gulf Coast Region," and recommend that it be published as a Farmers' Bulletin. This paper was prepared by Prof. S. M. Tracy, under the direction of the Agriculturist in charge of the Farm Management Investigations of this Bureau. Professor Tracy has given careful study for several years past to the subjects discussed in these pages.

Respectfully,

B. T. Galloway,
*Chief of Bureau.*

Hon. James Wilson,
*Secretary of Agriculture.*

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# SOME IMPORTANT GRASSES AND FORAGE PLANTS FOR THE GULF COAST REGION.

## MEXICAN CLOVER.

Mexican clover (*Richardsonia scabra*) (fig. 1), sometimes called "pusley" or "purslane," though entirely different from the plant known by those names in the North, is not a true clover, but belongs to the same family as the madder, poverty weed, and a number of other common plants. It is an annual which grows about as large and which has much the same habit of growth as the common red clover, but its leaves are opposite and simple instead of being alternate and 3-parted, as in the true clovers. It grows most abundantly in sandy cultivated fields from which early crops have been removed, and often makes a heavy growth in corn and cotton fields after those crops have been laid by. It is seldom planted, as, like crab-grass and beggarweed, with which it is usually found, it makes a volunteer growth late in the season and the yield would be increased very little if it were sown early and the ground given up to it through the entire year. It is common in old fields, from southern Florida to central Georgia and westward to southern Mississippi, making a fair growth on soils too poor and sandy for most other crops and being more thrifty on fertile fields, where it often makes a growth of 4 to 5 feet.

Mexican clover is used both for hay and for grazing. While the hay is somewhat hard to cure when cut early and is not of the best quality, it is eaten readily by most animals. It is usually more or less mixed with crab-grass and beggarweed, and adds largely to the bulk and value of a volunteer crop of these. When used for grazing, Mexican clover is more valuable for hogs than for other stock. It can be grazed from about May until after heavy frosts, and will then reseed the ground abundantly. The seeds are very small and difficult to save, though they are sometimes beaten out with flails or gathered from the bottom of a mow in which the hay has been stored. For seeding, 4 or 5 pounds per acre is sufficient, but the more common method of distributing the plant is by mowing after the seed is matured, and then scattering the hay over the field on which the crop is wanted the following year.

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Opinions as to the value of Mexican clover differ widely, some farmers regarding it as a worthless weed, while others praise it very highly. One grower in northern Florida, who has cultivated it for fifteen years, reports that during last summer he kept 4 horses and 20 hogs for eight months on a field of 7 acres. This field had been in oats the previous season, and the growth, though somewhat mixed with crab-grass and beggarweed, was mostly Mexican clover. Another grower in extreme western Florida, who has grown this forage plant quite largely for twelve years, declares that it is a valuable volunteer plant in his cultivated fields, as it makes a heavy growth on

FIG. 1.—Mexican clover in corn, Monticello, Fla.

ground which would otherwise be vacant and adds largely to the yields of lands growing cowpeas, crab-grass, and other fall hay crops. Cattle and mules eat it readily, while hogs graze it with relish. When not required for forage, it gives a needed protection to the soil during winter, and is so thoroughly decayed by spring that it is not in the way of the plow. A liveryman at Thomasville, Ga., where the plant is quite common, says that it is as nearly worthless as anything ever made into hay, and that he will not use hay with which it is mixed. A southern Mississippi grower, on the contrary, says: "Cattle will pick it out from any other hay and eat it in preference to any." Similar conflicting statements could be quoted from nearly every section in the region in which it is grown.

While Mexican clover is not a nitrogen-gathering plant, like the true clovers, its growth is usually volunteer and so costs nothing; it protects the surface of the ground from the scorching sun in summer and from washing rains in winter, and adds to the fertility of the soil by providing humus. The plant should be regarded as an inexpensive substitute for something better rather than as one to be generally cultivated at much expense.

## BEGGARWEED.

Beggarweed (*Desmodium tortuosum*) is an important forage plant from southern Florida northward to southern Georgia and Alabama, though it is seldom found west of the Alabama River. It is an annual legume which is common as a volunteer growth in old fields with sandy soils, making its best growth late in the season—at the same time that crab-grass is growing most rapidly. It is erect in habit, reaching a height of 5 to 7 feet on good soils, and is used for hay, silage, and grazing. Like crab-grass, with which it usually grows, it makes a scattering and uneven volunteer growth on land which has not been plowed during the year, though, when occasional strips are left standing at the second cutting and the field is afterwards harrowed crosswise to scatter the seed, a good crop is often secured the second season after plowing. The volunteer growth, however, as is the case with all volunteer crops, is uneven and somewhat uncertain, and the better practice is to reseed the ground after oats, melons, or other early crops have been removed, using 25 to 30 pounds of rough seed to the acre. The seed is usually saved by stripping it from the plants by hand, the labor making the seed cost about 3 cents a pound.

In regions where beggarweed is grown most commonly it is seldom found as a volunteer crop on newly cleared lands, but it is more or less abundant in nearly all old fields, especially in cornfields (fig. 2) and cotton fields, where it springs up after the crop is laid by and where it furnishes a large amount of fine grazing after these crops have been gathered. Some cotton growers object to beggarweed in their fields, as the immature seeds are somewhat rough and, when switched about by the wind, often pull the seed cotton from the bolls. It is easily killed by a single cultivation in late summer and soon disappears from fields which are not plowed.

When used for hay beggarweed should be cut about the time it is beginning to bloom, in June or July, and a second cutting can then be made a few weeks later. When cut at the right time and properly cured it has no superior for hay, but it must be handled with care and should be windrowed as soon as wilted to prevent the leaves

from dropping. If allowed to become too old before it is cut, many of the lower leaves are lost and the stems become hard and woody, though if run through a shredder the stems are eaten readily by stock, even when quite mature. It makes a yield of from 1 to 2 tons per acre. The hay, especially that made from the second cutting, is usually mixed with more or less crab-grass, cockspur, and Mexican clover. When well cured the hay is very fattening; dairymen prize it highly for the flavor which it gives to milk when fed during the winter, and they often sow the seed with cowpeas for that reason.

FIG. 2.—Florida beggarweed in corn, Monticello, Fla.

Although not sufficiently bulky for use alone in filling a silo, a little beggarweed adds greatly to the value of silage, as it gives a marked "June" flavor to butter, even when fed in midwinter. Its greatest value, however, is as a grazing plant for late summer and fall. All kinds of stock eat it with relish and make rapid gains in flesh while pasturing on it.

While beggarweed is a crop of secondary importance and fields are seldom used for growing it alone, it is a welcome addition to any hay crop, and when it is so abundant as to afford good grazing it will fatten horses, mules, and cattle more quickly than any other plant.

## VELVET BEANS.

The velvet bean (*Mucuna utilis*) is the most rank-growing legume cultivated for forage and is one of the most valuable annual plants both for the production of feed and as a restorative crop in a rotation. It is not as good as the cowpea for making hay, as its growth is so strong and the vines are so long and tangled that it is difficult to cut and cure, but it makes an immense amount of fall and winter grazing, produces seed abundantly, and leaves the soil in a fine condition for any succeeding crop. It needs a long season (about eight months) for maturing, and so is rarely grown north of a line from Savannah, Ga., westward to Austin, Tex., and is most common on the sandy

FIG. 3.—Velvet beans in corn, De Funiak Springs, Fla.

lands east of the Mississippi River. It is grown more extensively in Florida than elsewhere, there probably being more acres devoted to the crop in that State than in all the rest of the country.

The velvet bean is one of the best plants for newly cleared lands, as its growth is so dense and rapid that it smothers all weeds, sprouts, and grass and as it "civilizes" the soil better than any other crop. The vines should be given some support to keep them up from the ground, as otherwise they will not fruit well or make the most vigorous growth. Poles are sometimes used for that purpose, but are expensive and troublesome, and cornstalks are more commonly used (fig. 3). Some strong-growing variety of corn, often the "Mexican June," is planted at the same time as the beans, or a few

days earlier, and the stalks give the needed support to the vines. Some planters prefer to top the corn as soon as the ears are fairly mature, claiming that the part of the stalk which is left is not pulled over by the vines as easily as is the whole stalk; others plant three rows of corn and one of beans, claiming that in that way they get a good crop of both corn and beans; still others plant the corn in 7-foot rows and when it is about a foot high plant beans in the middles. When planted in that way the corn matures a full crop and the bean vines have a fair support. Planting is done as early in the spring as is safe, as late plantings never make seed as freely as do those made as soon as there is no further danger from late frosts. From 6 to 8 quarts of seed per acre are used. The heaviest yields of both vines and seed are undoubtedly secured when the beans are planted in every row at the same time the corn is planted, but with such treatment the yield of corn is usually small.

With a good support for the vines the yield of seed is very heavy—from 40 to 75 bushels per acre. The seed is gathered by hand at a cost of from 15 to 20 cents for a barrel of pods, which will make a little more than a bushel of shelled beans. Thrashing is rather difficult, as the pods are tough and very close together, but at present prices the seed alone makes a profitable crop. When a crop of seed has been gathered, the vines and immature seeds which are left still make rich grazing, and the fertilizing effect of the crop on the soil is little changed.

A dairyman in northern Florida reports that he had 20 acres of velvet beans last year and began grazing them just before frost. He grazed 30 cows one-half of each day for twenty-seven days, and then gathered 20,000 pounds of beans in pods. These were ground, steamed, and mixed with wheat bran and cotton-seed meal, which made a rich feed for his cows. Another grower in southern Georgia states that he grazed 100 cattle for four months on 80 acres of the beans, the cattle beginning to graze immediately after the first frost. He follows a rotation of cotton, corn followed by winter oats, and velvet beans after the oats are harvested in May. This rotation makes the beans mature too late for their best growth, but gives a good profit on the work, as the cotton this year yielded a trifle more than a bale to the acre on land where beans were grown last year, and that without any other fertilizer. He plants the beans about 1 by 3½ feet apart and cultivates twice.

A grower in western Florida last year planted a field of 6 acres of velvet beans early in April. In June he put 60 hogs in the field. These hogs ate the volunteer Mexican clover first, and then the volunteer beggarweed, doing so little harm to the beans that 12 tons of hay were cut from the field in September. The same grower states

that beginning in October seventy days of grazing on velvet beans will make a steer ready for market.

Grazing usually begins at about the time of the first frost and may be continued until February or March, as both the vines and the beans remain in edible condition through the winter. The beans are quite hard when matured and dry, but are eaten well in the fall or whenever they become slightly softened by rains or by lying on the damp ground, so that all are consumed before the ground is plowed in the spring. Dairymen find that fall grazing is the greatest stimulus to milk production, while beef growers value velvet beans more highly for winter feeding. The dry beans are so hard that they do not rank high for feeding. Horses do not eat them well, as the short, stiff hairs on the pods soon give them sore mouths, while grinding and steaming are too expensive for ordinary purposes.

The plant is seldom used for hay on account of the difficulty in cutting and curing. When cut early and well cured the hay is of fine quality, but when cut late many of the leaves are lost and the stems become dry and woody. As a hay plant it is less satisfactory than the cowpea.

The principal value of the velvet bean is as a crop for winter grazing, and for that purpose it is the best plant grown in the Gulf region. It grows well on soils which are very light and sandy and produces a heavy yield of excellent feed, but it occupies the ground through the entire year and so can not take the place of the vetches, crimson clover, or cowpeas as a catch crop for a short season.

## GUINEA GRASS.

Guinea grass (*Panicum maximum*) (fig. 4) is an African species which is a common grazing grass in Cuba and other West Indian islands. It was introduced into southern Florida as early as 1870 and probably much earlier. It has often been confused with Johnson grass, which has been called by the same name, though very different in appearance and habit of growth. Johnson grass spreads by long, fleshy, underground stems and has seeds which are of a yellow, red, or black color, while the true Guinea grass grows in dense, erect clumps, does not spread by underground stems, and has smaller seeds, which are dark green in color. The leaves of Guinea grass are never streaked with red or yellow, as are those of Johnson grass. Anyone who will note any of these characters need not mistake one for the other. Guinea grass does well on moderately dry soil, growing from 6 to 10 feet high, and is used principally for grazing and soiling.

Guinea grass is propagated either by divisions of the old roots or by seeds. When roots are used the old clumps are dug out early in spring and divided to make as many sets as can be secured with a few fibrous roots attached. When these sets are planted on good ground they will give a good cutting of hay or be ready for grazing in May. Seeds are planted at the same season as the roots, it being the usual practice to plant the seeds thickly in drills and then transplant the seedlings as soon as they are 3 or 4 inches high. Volunteer seedlings are often found in abundance where the old plants have been allowed to mature seed. Sets are more expensive and more troublesome to handle than are seedlings, but will give an earlier and heavier yield

FIG. 4.—Guinea grass, Biloxi, Miss.

the first season. Plants should be set about 2 feet apart in rows 5 to 6 feet apart and should be cultivated three or four times during the season. The grass will live many years without cultivation, but when the ground is not kept loose it makes only a weak growth and does not produce one-fourth the yield which it makes when a cultivator is run between the rows a few times early in the season. When grown without such cultivation the yield is seldom satisfactory. On thin soils a dressing of cotton-seed meal before each cultivation adds largely to the yield. As this grass has no runners or underground stems, it can be killed by plowing out the roots at any time during the winter and has no tendency to become a weed.

Guinea grass begins its growth rather late in the spring, seldom giving much feed before May, but after that time it will give good

cuttings about once every three or four weeks until its growth is checked by frost. In the most favorable part of the season cuttings may be made once in 10 or 12 days, but such rapid growth usually continues only a few weeks. When allowed to stand too long the stalks become hard and woody. This grass makes the best feed if cut when 24 to 36 inches high.

It is difficult to estimate the yield of hay per acre, as Guinea grass is commonly used only for soiling or grazing. Its habit of growing in large clumps makes it difficult to use a machine in cutting this grass for hay. One grower who has used it many years for soiling reports that he can feed 4 head of cattle per acre through the entire season, while another, who is growing cattle extensively, reports that he grazes 3 head per acre through the year, though he also gives his cattle a little Para hay during the winter. A grower in southern Florida says: "It is the best grazing grass we have." Another says: "It yields more than any other grass." Similar statements are made by growers in southern Alabama and southern Mississippi.

The chief value of Guinea grass is as a soiling crop, and it makes more good feed for that purpose than any other grass we have. If cut when only 3 or 4 feet high, the stem is very tender and succulent, nearly the entire growth consisting of rather broad, smooth leaves. When cut at this stage the whole plant is eaten with relish by all kinds of stock. When allowed to grow until it makes seed the stems become hard and woody, though the leaves remain green and are eaten well. It is specially valuable to those who have only small places and who wish a constant supply of green feed for a few horses or cows. Its range of profitable cultivation is about the same as that for Para grass, including the whole of Florida and a narrow strip along the coast westward to Texas south of latitude 31°.

## PARA GRASS.

Para grass (*Panicum molle*) (fig. 5), which was introduced from South America many years ago, is now common in central and southern Florida and is rapidly coming into favor farther west, especially in southern Texas. It is a rank-growing perennial which spreads by surface runners, which are often 30 or more feet in length and which form roots at each joint. As soon as the ground becomes fairly covered with these runners the younger stems assume a more erect position, reaching a height of 3 to 5 feet and producing a heavy yield for hay or grazing. Although this grass spreads so rapidly by its long runners, it is more easily killed than Bermuda or Johnson grass, as the runners are wholly on the surface of the ground, and it can be killed by a very shallow plowing followed by a thorough

raking. While it makes a fair growth on rather dry soil, it does much better on damp ground and grows well on the margins of ponds and on ditch banks, often reaching out to where the water is 3 or 4 feet deep. It is a desirable species for planting on lands liable to overflows, as it is not killed when covered by water for a month or more.

Para grass produces few seeds (usually none in this country) and is generally propagated by divisions of the runners, which root easily when cut into pieces of 2 or 3 joints each and pushed down into freshly plowed ground so as to leave the upper joint at or just below

FIG. 5.—Para grass, third year, Kingsville, Tex.

the surface. When sets are abundant, it is better to put them not more than 2 feet apart in each direction, as such close planting enables the grass to cover the ground more quickly and so induces the erect growth more promptly. When wanted for grazing only, close planting is less important and the sets may be placed 4 to 6 feet apart.

The hay made from Para grass is rather coarse, but is sweet, tender, and nutritious, and the yield is very heavy. One Texas grower reports 6 tons per acre from each of 2 cuttings on a 12-acre field, the second cutting being made in October and followed by excellent winter grazing. Florida growers usually make 3 or 4 cuttings annually, and the hay finds a ready market at the highest price. One

grower in southern Florida reports that he makes his first cutting about April 1 and a second cutting about June 1. The ground is then plowed broadcast and harrowed smooth. Two more cuttings are made, in September and November, after which the field gives good grazing until the stock is taken off in March. This is on low ground which is drained by open ditches. The grass makes 2 or more tons of hay at each cutting, and the hay is readily sold to near-by liverymen. Of course such heavy cropping requires liberal fertilizing, but that can well be afforded when a yield of 8 to 10 tons of hay a year is secured, in addition to four months of good grazing. Another grower, in northern Florida, where the grass is more subject to injury by freezing, states that he finds it better to plow the ground in November or December, as the plowing covers portions of the stems, so that they are protected from heavy frosts, and an earlier spring growth is insured.

Para grass is excellent for pasture, is not injured by moderately close grazing or by heavy tramping, and remains green through the entire year, except when cut by frosts. Last year one field of 10 acres in southern Texas gave grazing for 15 cows from April to November, and when the stock was removed the grass was fully 2 feet high and appeared to be growing faster than it was eaten, though the field had not been irrigated during the previous eighteen months. A grower in southern Mississippi reports equally good results from a planting made on low, rich land, and very poor results when planted on high, dry clay. A grower in central Florida states that his field of Para grass gives good grazing for 6 head of cattle per acre at least eight months each year. Another grower, in southern Florida, who has used a few acres of it for pasture a number of years, increased his planting to 100 acres last year, and others in the same section are making similar plantings.

Some orange growers who have Para grass thoroughly established in their groves complain that it makes cultivation troublesome, but as it seldom grows from seed, it is not difficult to hold it in check by the occasional use of a disk harrow. While this grass can be destroyed more easily than some other grasses, it is seldom advisable to plant it in fields which are soon to be used for other crops, but it has great value for making permanent meadows and pastures on wet or even moderately damp soils. As it is killed to the ground by heavy frosts it is not recommended for planting farther north than the northern boundary of Florida, or about latitude 31°.

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